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SCIENTIFIC JOURNALS AND ARTICLES.

THE *Bulletin of the Torrey Botanical Club* for February contains a paper 'On Atavistic Variation in *Oenothera cruciata*,' by Hugo de Vries; 'Nova Ascomycetum Genera Speciesque,' by Frederic E. Clements; 'New Species of Fungi,' by Charles H. Peck; 'A Fossil Petal and a Fossil Fruit from the Cretaceous (Dakota Group) of Kansas,' by Arthur Hollick; 'Notes on Antillean Pines, with Description of a New Species from the Isle of Pines,' by W. W. Rowlee; 'The Polyporaceæ of North America, II., the Genus *Pyropolyporus*,' by William Alphonso Murrill; and the usual instalment of the 'Index to Recent Literature Relating to American Botany.' The March number consists mainly of 'Studies in Plant Hybrids: The Spermatogenesis of Hybrid Cotton,' by William Austin Cannon, but includes a biographical sketch of Dr. Timothy Field Allen by N. L. Britton; 'Studies in the Asclepiadaceæ—VII., A New Species of *Vincetoxicum* from Alabama,' by Anna Murray Vail; 'A New Species of *Waldsteinia* from Idaho,' by C. V. Piper; and the 'Index to Recent Literature.'

THE February number of *Torrey* contains 'Notes on Southern Ferns,' by L. M. Underwood; '*Trichomanes Petersii* Found Anew,' by A. B. Seymour; 'A Unique Climbing Plant,' by Roland M. Harper; 'An Undescribed *Eleocharis* from Pennsylvania,' by N. L. Britton, and 'A Key to the North-American Species of *Stropharia*,' by F. S. Earle. Carlton C. Curtis reviews Kraemer's 'Course in Botany and Pharmacognosy,' and this is followed by the 'Proceedings of the Club' and news items.

Torrey for March includes 'Vital Persistence of *Agave Americana*,' by S. B. Parish; 'A Key to the North-American Species of *Lentinus*—I.,' by F. S. Earle; 'The Pubescence of Species of *Astragalus*,' by Francis Ramaley; 'Insect Visitors of *Scrophularia*,' by T. D. A. Cockerell; and 'Some Interesting Hepaticæ from Maine,' by Caroline Coventry Haynes. C. C. Curtis reviews MacDougal's

'Influence of Light and Darkness upon Growth and Development,' and the number is completed by the 'Proceedings of the Club' and news items.

SOCIETIES AND ACADEMIES.

THE NATIONAL ACADEMY OF SCIENCES.

THE following papers were either read or presented by title at the stated session of the National Academy of Sciences held at Washington on April 21, 22 and 23:

HENRY F. OSBORN: 'An Estimate of the Weight of the Skeleton in the Sauropoda, or in the Sauropodous Dinosaurs.'

HENRY F. OSBORN: 'New Characters of the Skulls of Carnivorous and Herbivorous Dinosaurs.'

HENRY F. OSBORN: 'Models illustrating the Evolution of the Amblypoda, also of the Dinosaur *Diplodocus*, together with a Theory as to the Habits of the Sauropoda.'

GEORGE F. BARKER: 'Radioactivity of Thorium Minerals.'

J. M. CRAFTS: 'The Law of Catalysis in Concentrated Solutions.'

J. M. CRAFTS: 'The Standardization of Thermometric Measurements.'

GEORGE E. HALE: 'The Rumford Spectroheliograph of the Yerkes Observatory.'

LEWIS BOSS: 'The Determination of Standard Right-ascensions free from the Personal Equation for Star-magnitude.' (With stereopticon illustrations.)

R. A. HARRIS: 'On the Semi-diurnal Tide of the Northern Part of the Indian Ocean.' (Introduced by Cleveland Abbe.)

ARTHUR L. DAY: 'The Melting Point of a Simple Glass.' (Introduced by G. F. Becker.)

THEODORE GILL: 'Biographical Memoir of J. E. Holbrook.'

GEORGE F. BARKER: 'Biographical Memoir of Matthew Carey Lea.'

S. F. EMMONS: 'Biographical Memoir of Clarence King.'

JEFFRIES WYMAN: 'Biographical Memoir of A. A. Gould.' (Read by W. H. Dall.)

CHARLES S. HASTINGS: 'Biographical Memoir of James E. Keeler.'

CARL BARUS: 'The Diffusion of Vapor into Nucleated Air.'

H. P. BOWDITCH: 'Biographical Memoir of Theodore Lyman.'

ALEXANDER AGASSIZ: 'The Nomenclature of the Topography of the Bottom of the Oceans.'

S. WEIR MITCHELL: 'On the Discovery of an Antidote for Rattlesnake Poison.'

ALEX. GRAHAM BELL: 'On the Tetrahedral Principle in Kite Structure.'

BIOLOGICAL SOCIETY OF WASHINGTON.

THE 370th meeting was held on Saturday, April 4.

H. J. Webber discussed 'Bud Sports and Bud Variation in Breeding.'

The speaker called attention to the very numerous cases of bud sports which have been described in literature and discussed a number of instances that had come under his personal observation. All parts of a plant, it was pointed out, may exhibit this phenomenon; in some cases almost the entire plant shows the change, while in others the variation is limited to a single fruit or flower or a segment of a fruit or portion of a flower.

Many cases seem unquestionably to be instances of reversion to some ancestral type, while in other cases the change would seem to be attributable to another cause. The writer outlined an hypothesis accounting for the occurrence of such bud sports as segregation changes in the division of meristematic cells in the bud. In plants of mixed or hybrid origin a segregation of the pangens or anlagen representing an allelomorph, or character pair, was presumed to occur in certain somatic cells resulting in a separation of the anlagen, as in the case of the pollen and egg cell formation of first generation hybrids, following Mendel's hypothesis. In the case of the appearance of new characters the speaker assumes that here, and also in the case of hybrids, the new combination of pangens representing various characters results in the formation of a new crystallization, as it were, which appears as a new character.

Rodney H. True described 'The Manufacture of Tea in America,' illustrating his remarks with lantern slides. He stated that all varieties of tea plant used in American experiments belonged to one botanical species, the class of tea, green, black or oolong, being in large measure the result of factory treatment.

There are present within the tea leaf

tannin and oxidizing enzymes, which on uniting form a reddish-brown product, allied to the class of bodies known as phlobaphenes.

In the making of green tea the leaves are so dried as to destroy the oxidizing enzymes before they react with the tannin, thus retaining the green color of the leaf. The application of heat is the usual method of destroying the enzymes. Light exerts also a destructive influence on this class of bodies.

In making black tea any process hindering the reaction between the tannin and oxidases is avoided until the fermentation has been completed. The high temperature attained during the final firing destroys the oxidases and prevents further fermentation.

Oolong teas represent a class in which the action of the oxidases on the tannin has been begun, but has been stopped before full fermentation has taken place.

Owing to the fact that various varieties of tea contain oxidases in varying quantities, the readiness with which black tea can be made from these varieties is also variable.

W. C. Kendall spoke on 'The Trout of the Rangeley Lakes,' saying that the fish fauna of these waters was poor in species, although the lakes were renowned for the size of their brook trout, examples of which reached a size of from nine to eleven pounds. The trout was now extinct in Lake Umbagog, and while the blame of this was laid on the pickerel, there were reasons for believing that the pickerel was not wholly, if at all, to blame. The speaker stated that while it had been denied that the Rangeley trout were decreasing, yet such was the case, and that the angler was probably to blame for it by the introduction of the landlocked salmon. This fish made additional demands on the small food supply, introduced a competitor to the trout and, possibly, an additional enemy. Mr. Kendall then discussed the blue-backed trout, *Salmo quassa*, a species supposed to be peculiar to the Rangeley Lakes, and noted that this fish had become rare within the last few years, although those taken were much larger than the average size of this trout. The possible reasons for the decrease were considered, and

it was stated that possibly *Salmo oquossa*, *S. oquossa marstoni*, and *S. alpinus aureolus* might prove to be different forms of one species.

F. A. LUCAS.

ENTOMOLOGICAL SOCIETY OF WASHINGTON.

THE 176th regular meeting was held on March 12, 1903, fifteen members and three visitors present. Mr. W. D. Kearfott, of New York City, was elected a corresponding member, and Messrs. H. E. Burke and J. L. Webb, of the Bureau of Forestry, U. S. Department of Agriculture, active members.

Mr. Busck announced that a collecting excursion to Bladensburg had been planned for the 26th of March.

Mr. Ashmead exhibited two wasps from Trong, Lower Siam. The first, *Vespa doryloides* Saussure, superficially resembles the male of *Dorylus*, a genus of large ants. It appears to possess characters which differentiate it from *Vespa* and justify placing it in a new genus. The other specimen belongs to the genus *Ischnogaster*. This genus, though classified with the Eumenidæ, a family composed mostly of forms which are solitary in habit, is nevertheless said to be represented in India by social species. Mr. Ashmead showed, also, a specimen of the large Japanese wasp, *Vespa mandarinia* Smith, now placed in Thomson's genus *Vespula*.

Dr. Dyar presented a short paper entitled 'Note on *Crambus effectalis* Hulst and Allied Forms.' A specimen from New Mexico, confused with *effectalis*, is described as a new species of *Evetria*.

Mr. Barber read a letter written from Cuba by Mr. E. A. Schwarz, containing much interesting entomological matter. Dr. Howard stated that Mr. Schwarz had found what may prove to be the original food plant of the cotton-boll weevil (*Anthonomus grandis* Boheman), namely, the wild 'kidney cotton' (*Gossypium brasiliense*?)

Dr. Hopkins read extracts from letters reporting a recent very destructive outbreak of the 'pine bombyx' (*Dendrolimus pini* Linnaeus) in the redwood forests in Norway. Until the past season the moth has not occurred

there in sufficient numbers to cause serious damage since the outbreak of 1812 to 1816.

Dr. Dyar reported some early dates for the hatching of mosquito eggs. Eggs of *Culex canadensis* in his possession had hatched on the 9th of March, while at Lahaway, New Jersey, Mr. J. Turner Brakeley had found larvæ under the ice in February.

Mr. Banks showed a nest of the 'purse-web spider' (*Atypus abboti* Hentz) which he had found at Falls Church, Virginia. The species is rare here, though known as far north as Massachusetts.

Dr. Dyar presented a paper entitled 'New North American Lepidoptera, with Notes on Larvæ.'

Mr. Busck showed specimens of a buff and gold colored form of the codling moth (*Cydia pomonella* Linnaeus), describing it as *simpsonii*, new variety.

Mr. Currie read a paper on 'The Odonata (dragonflies) Collected by Messrs. Schwarz and Barber in Arizona and New Mexico.' This collection, he stated, contained twenty-four species and two varieties. One species, an *Ischnura*, proved to be new.

Under the title 'Some Remarks on Japanese Hymenoptera' Mr. Ashmead commented upon the Japanese species in the U. S. National Museum. The Aculeata, he said, belonged mostly to described species, but in the Parasitica there were probably 150 new species. He believed there were in the neighborhood of 500 described Japanese Hymenoptera.

ROLLA P. CURRIE,
Recording Secretary.

PHILOSOPHICAL SOCIETY OF WASHINGTON.

THE 564th regular meeting was held February 28, 1903.

Mr. C. G. Abbot presented an elaborate approximate method for the quadrature of the circle, recently furnished by a correspondent of the Smithsonian Institution.

Mr. C. F. Marvin then spoke on 'The Seismograph.' He said the first instruments were crude and effective. The earthquake in Japan in 1880 led to the formation of a seismological society (among the first members of which were two of our own members,

Messrs. Mendenhall and Paul) and to the development of the modern type of instruments. A large instrument was exhibited of the 'inertia-type,' in which a heavy suspended mass serves as a fixed point for attachment of levers, the distant end of which carries a recording point, while a frame subject to any earth-tremors engages the levers at an intermediate point. Professor Newcomb described briefly the instruments shown him during the past summer at Göttingen.

Dr. A. L. Day then, with the aid of lantern illustrations, presented the modern view of 'Black Bodies' and the great developments that had followed the introduction of the hollow internally reflecting and radiating shell, whose radiations reached an outside instrument through a small hole in the wall. Such a body is theoretically more perfectly 'black' and practically more permanent and manageable than any body that is black to the eye. The methods of estimating the temperature of a highly heated body from the nature of its radiations were pointed out.

At the 565th meeting, held March 14, 1903, the death, on February 28, of Professor William Harkness, formerly the president of this society, was announced.

On the call for informal communications Professor Cleveland Abbe exhibited a collection of half-tone plates of snow-crystals just published by the Weather Bureau. The original photomicrographs were selected from the enormous collection of plates taken by Mr. Bentley, of Jericho, Vt.

The first regular paper had been announced to be by Mr. Gilbert T. Walker, of England, on 'Boomerangs'; but he was unable to appear, owing to a strain received in the afternoon during a public exhibition of his remarkable skill in designing and throwing these weapons. In his absence there was a general discussion of the subject and of his demonstrations. Attention was called to his papers on the subject in *SCIENCE* and the 'Smithsonian Report' for 1901.

The new Baldwin computing machine, made in the United States, and put on the market by the Spectator Company, of New York, was

exhibited and explained by Professor Marvin. Speaking generally, it is similar in principle and capacity to the long-known Thomas machine, but is more compact and differs in nearly all its details.

Mr. George R. Stetson then read a paper on 'The Genetic Problem of Typography.' He outlined the various claims made for Coster, Fust, Guttenberg and Schoeffer, emphasizing the great difficulty of finding sufficient evidence to establish priority with certainty, and pointing out the very divergent conclusions to which the principal writers on this history have come. He concluded with a description of the Plantin Museum of Typography at Antwerp.

CHARLES K. WEAD,
Secretary.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

January 19, 1903.—Mr. W. L. Sheldon presented a summary of the progress in the science of ethics, since the publication of Darwin's 'Descent of Man,' in 1871.

Two persons were elected to active membership.

February 2, 1903.—Dr. Tarleton H. Bean delivered an illustrated lecture on 'The Salmon and Salmon Fisheries of Alaska.'

Dr. R. J. Terry reported on a case of right aortic arch in man—of relatively rare occurrence—and by the aid of lantern slides and blackboard diagrams indicated its peculiar features and morphological significance with reference to the circulatory system of the embryo and of adults in lower groups of vertebrates.

One person was elected to active membership.

February 16, 1903.—Professor A. W. Greeley gave an account of experiments on protoplasm of variations in temperature and water contents, in which it was shown that in the case of certain algæ and protozoa, and in the eggs of some of the marine invertebrates, a reduction of temperature gave rise to parthenogenetic spore formation or egg segmentation, as was also the case when water was plasmolytically withdrawn from the cells.

One person was elected to active membership.

March 2, 1903.—Professor F. E. Nipher gave an account of his experiments in the production of ether waves by means of explosions. He is now using a brass tube, six feet long and one and one third inches in diameter, for the explosive, which is laid in a train from end to end. This tube is placed within a large brass tube, one and three eighths inches in diameter, which is wound with 25,700 windings of No. 25 copper wire. This coil is connected with a delicate D'Arsonval galvanometer. The coil is placed with its axis in the magnetic meridian. When gunpowder is exploded in the inner tube, the galvanometer gives indication of a change in permeability of the heated channel within the coil. The results were said to be as yet inconclusive, and the apparatus is to be somewhat modified, with a view to making it more sensitive.

March 16, 1903.—Dr. H. M. Whelpley gave an illustrated account of the sacred pipe-stone quarries of the upper Missouri.

April 6, 1903.—Professor A. S. Chessin presented a communication on the strains and stresses in a rotating thin circular disk.

Professor F. E. Nipher reported that he had apparently succeeded in producing a distortion of a magnetic field by means of explosions. The apparatus used was a transformer consisting of concentric coils wound upon brass tubes. The outer tube was five inches in diameter and six feet long, wound with over four thousand windings of No. 16 wire. This coil was traversed by a continuous current from a storage battery. Within this, and separated from it by an air-space of an inch, is a secondary coil of equal length having over twenty-five thousand windings of No. 25 wire. This coil is connected to a D'Arsonval galvanometer. Within the tube on which this coil is wound is a smaller brass tube, within which a train of black gunpowder is laid. This tube is open at both ends, and has practically no recoil when the explosion is made. When hung by a bifilar suspension on cords ten feet in length, the recoil is about an inch. When the exciting current is small compared with the capacity of the battery, the galvanometer reading is very steady.

When the train is exploded, a sudden and marked throw of the galvanometer results, which could be accounted for by an increase in the permeability of the long explosion chamber. The deflection reverses when the field is reversed. The hot gases liberated in the explosion are all diamagnetic, and tend to decrease the observed effect. In two cases the galvanometer deflection was in the opposite direction from that stated above, and this is being further inquired into. When seven tubes between the two coils are simultaneously exploded, only slight effects could be obtained, and these deflections are wavering, or to and fro, in character. A wire was threaded through the inner combustion tube, through which a current of three ampères was passed. This circuit was opened and closed with no visible effect. The galvanometer circuit is shielded by tin-foil, which is also connected with the explosion tube, and grounded. Sparks an inch long to the tin-foil produce no result. When the explosion tube is removed from the transformer, and taken near the galvanometer, or the storage battery, no deflection is produced by the explosion.

An explosive mixture of gases from water electrolysis under atmospheric pressure produces a much less violent explosion, and produces a correspondingly less effect. The scale reading of the galvanometer changes by over twenty divisions with the heaviest explosions and an exciting current of 0.6 ampère. With smaller explosions or feebler currents, the effect is diminished. No deflections can be produced by striking the table upon which the transformer rests, nor by striking the transformer itself, even when it moves slightly under the blow. The secondary and primary coils are held rigidly in fixed position with respect to each other.

Arrangements have now been made to place the explosion tube in the focal line of a parabolic cylinder of metal, the galvanometer coil being in the focal line of a similar mirror. Either or both are to be surrounded by an exciting coil.

This line of research was suggested by Young's account of his observation of five

solar outbursts in 1872, which were each accompanied by sharp fluctuations in the magnetic tracings at Kew and Stonyhurst. Since the experiments began, volcanic explosions have produced such ether waves, which have been simultaneously recorded over the continents of Europe and America.

Mrs. Eliza McMillan and Mr. Wm. Northrop McMillan, the donors to the academy of a home, as noted elsewhere, were elected patrons of the academy.

WILLIAM TRELEASE,
Recording Secretary.

DISCUSSION AND CORRESPONDENCE.

THE FIRST USE OF THE WORD 'BAROMETER.'

TO THE EDITOR OF SCIENCE: I quite agree with Dr. Bolton's conclusion that Robert Boyle introduced the word 'barometer' into our language about the year 1665 (SCIENCE, p. 548). Although Dr. Bolton finds that the first use of the word by Boyle was in the *Philosophical Transactions* of 1666, yet he suspects him to be the author of an anonymous communication to that journal the previous year, in which the 'suspended Cylinder of Quicksilver' was called a 'Barometer or Baroscope.' For conclusive proof that Boyle really used these terms in the year 1665, I would cite a work that appears to have escaped Dr. Bolton's notice, viz., 'The General History of the Air * * * by the Hon. Robert Boyle, Esq.,' published in London in 1692, which contains 'A short Account of the Statical Baroscope, imparted by Mr. Boyle, March 24, 1665.' In this letter to Mr. H. Oldenburgh, Boyle describes the instrument as some large and light glass bubbles, counterpoised in a pair of scales, and placed near a 'Mercurial Baroscope' (also called a 'Barometer' in the same letter), from which he might learn the present weight of the atmosphere. The same work contains probably the earliest systematic register of thermometer, barometer, hygrometer, wind and weather in England, viz., that kept by J. Locke, the philosopher, at Oxford and at London, between 1666 and 1683, with interruptions. The reading of the mercurial barometer, designed

at first 'baroscope,' was recorded in inches and tenths, but in another register, kept at Townley, in Lancashire, during a portion of the years 1670 and 1671, it was recorded to hundredths of an inch.

Professor G. Hellmann, the eminent German meteorological bibliographer and historian, although cognizant of Boyle's 'General History of the Air,' seems to be unaware of the letter quoted, since he also states in the introduction to No. 7 of his 'Neudrucke von Schriften und Karten über Meteorologie und Erdmagnetismus' that the word 'barometer' was first used by Robert Boyle in 1666, whereas it is certain, from what I have shown, that Boyle had already employed it the year before.

A. LAWRENCE ROTCH.

BLUE HILL OBSERVATORY,
April 13, 1903.

SHORTER ARTICLES.

A PRELIMINARY ACCOUNT OF THE EXPLORATION OF THE POTTER CREEK CAVE, SHASTA COUNTY, CALIFORNIA.

THE Potter Creek cave lies in a belt of gray Carboniferous limestone, about a mile southeast of the United States Fishery Station on the McCloud River at Baird, Shasta County. The mouth of the cave is situated in a bluff on the north side of Potter Creek, at an elevation of 1,500 feet above sea level, and about 725 feet above the McCloud.

The existence of bones in the cave was first discovered in 1878 by Mr. J. A. Richardson, who found there the skull of a large extinct bear afterwards described by Professor Cope as *Arctotherium simum*.^{*} This specimen is now in the Cope collection at the American Museum of Natural History, New York.

The cave was rediscovered by Mr. E. L. Furlong, of the University of California, in July of the past year. Mr. Furlong penetrated the deposit on the floor of the main chamber, with the result that a large number of bones representing a Quaternary fauna were found in a series of stratified deposits of pebbly clay, cave breccia, stalagmite and volcanic ash. On Mr. Furlong's return to

^{*} Cope, *Am. Nat.*, XIII., p. 791; XXV., pp. 997-999, Pl. XXI.